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## Author Affiliation:

Department of Silviculture and Agroforestry, Faculty of Forestry, Birsa Agricultural University, Kanke, Ranchi, Jharkhand, 834006  
Email: ashirwadaspire351@gmail.com  
ORCID ID: <https://orcid.org/0000-0001-7772-2616>

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# An Outbreak of Teak Skeletonizer *Eutectona machaeralis* Walker in the Eastern Ghats, India with Ecological Notes

Ashirwad Tripathy

## ABSTRACT

Teak skeletonizer, *Eutectona machaeralis* is a serious pest of *Tectona grandis* (Teak). Teak is one of the important plantation tree species being utilized in many industries. During the field visit of Eastern Ghats in Odisha from August to November of 2018, an outbreak was observed in teak plantations and forest areas caused by *E. machaeralis*. The leaves were infested with 5-7 caterpillars of *E. machaeralis*. The infestation starts from the leaf margin, and gradual skeletalization of the leaves to the midrib occur by the caterpillars. No two caterpillar tends to feed in other's feeding zone. Instead, all were separated with their feeding zone, which eventually gets close and gets connected. Therefore, management practices need plantation of suitable teak clones resistant to *E. machaeralis* in the plantation areas to reduce this economic damage.

**Keywords:** Skeletonizer, Eastern Ghat, Teak, Outbreak, Odisha

In India, teak grows naturally in 9 million hectares of southern tropical deciduous forests of Peninsular India situated below 24° N latitude (Seth and Kaul 1978). There are already 1.5 million hectares of teak plantations in India, and an additional 50,000 ha are planted every year (Subramanian et al. 2000). As a result, it is one of the world's top five tropical plantation species and one of India's top five. Teak is grown in large-scale monoculture in many states, including Karnataka, Kerala, Gujarat, Madhya Pradesh, Odisha, Rajasthan, Uttar Pradesh, and Tamil Nadu (Tewari 1992). The state of Odisha has a total forest area of 58,135 km<sup>2</sup>, of which 2030 km<sup>2</sup> is teak. It can also be found in a forest of 21,024 square kilometres and other planting areas. Teak trees in India have been infested by about 187 different species of insects (Hutacharim and Tubtim 1995). The worst leaf-feeders are the teak skeletonizer, *Eutectona machaeralis* Walker (Pyralidae) and teak defoliator *Hyblaea puera* Cramer (Hyblaeidae), both of which are found in large numbers and are capable of causing significant damage to teak trees. An annual outbreak of these pests plagues Odisha and other teak-growing regions in India. In the early flushing

period of teak, these outbreaks cause trees to defoliate completely, but they can also cause partial defoliation in the later portion of the growth season (Nair 1988). Here, I am reporting the severe outbreak of *Eutectona machaeralis* in teak plantations and forests of different regions of Odisha, India.

The teak skeletonizer is so named because it transforms the entire leaf into a skeleton, leaving the veins intact. Teak is a valuable timber species utilized for various uses ranging from boat construction to furniture manufacture (Khan et al. 2017). Patil and Thontadarya (1983) observed a minimal *E. machaeralis* population during January-March. But *Eutectona machaeralis* is available between April and August, causing a 50% infection in teak leaves. Additionally, it demonstrates a downward tendency in population and infestation from August to December (Kabade et al. 2015). The host plants include *Tectona grandis*, *Vitex negundo*, *Gmelina arborea*, *Callicarpa cana* and *C. macrophylla* (Khan 2019; Kabade 2014; Nair 2007; Kumar and Prajapati 2005; Mishra and Singh 2004).

During a course work of Forest Work Experience (FWE) conducted by the College of Forestry (COF), Orissa University of Agriculture and Technology (OUAT) from August to November 2018, field observations of the severe outbreak in teak plantations and forests in Paralakhemundi Forest Division, Gajapati district was taken (18.849, 84.042; 18.764, 84.104; 19.275, 84.277; 19°10'45.3" N 84°12'58.2" E). Also, consultation regarding this outbreak with different groups of students of COF, OUAT in different forest divisions of Odisha was assessed during this period.

During these field observations, it was found that large scale plantations of *Tectona grandis* in different forest divisions of Odisha were skeletonized entirely (Fig. 1). The leaves turned to light brown. The whole plantation looks like a group of brown leaf trees from a distant view in the severely infested areas. A close examination of the plantations and scattered trees revealed the presence of *Eutectona machaeralis* all over the leaves. The females of *E. machaeralis* lay their eggs near the midrib of the leaves either singly or in patches completing the life cycle within 23 days (Dhobe and Naik 2015). The leaves were infested with 5-7 caterpillars of *E. machaeralis* (Fig. 2C). The infestation starts from the leaf margin, and gradual skeletalization of the leaves to the midrib occur by the caterpillars. No two caterpillar tends to feed in other's feeding zone. Instead, all were separated with their feeding zones, which eventually gets close and gets connected (Fig. 2B, 2C). During the pre-pupal stage, the caterpillar tends to stay in one place, spins a silk layer around it, and eventually turns into a pupa (Fig. 2D). Most of the pupation and cocoon formation was found on the teak leaves' ventral side (Fig. 2D). The heavy deposition of frass material by the feeding activities of *E. machaeralis* can be seen on the forest floor (Fig. 3D). Also, some of the scattered teak saplings and trees in the vicinity were found completely damaged free or very low infestation. This can be due to different clones of teak planting and their resistance to *E. machaeralis*.

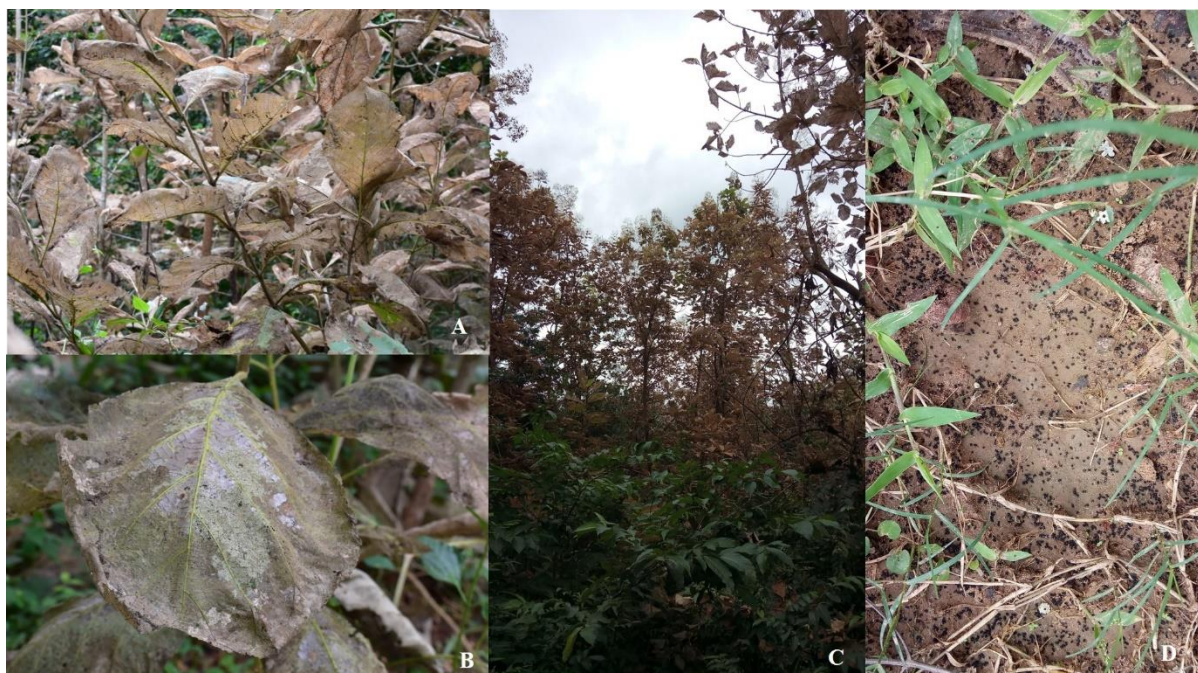


Fig. 1: showing damage caused by *Eutectona machaeralis* (indicated by white arrow) on *Tectona grandis*





**Fig. 2:** showing the gradual feeding damage caused by *Eutectona machaeralis*, **A-** Caterpillar skeletonizing the leaf, **B-** Different feeding zones of *Eutectona machaeralis*, **C-** Gradual merging of feeding zones to the midrib, **D-** Pupation and Cocoon formation



**Fig. 3:** Severe infestation lead to complete skeletonizing and browning of leaves of *Tectona grandis* (**A, B, C**), **D-** Frass material of *Eutectona machaeralis* present on the ground





**Fig. 4** Showing browning of complete Teak Plantation

Therefore, suitable teak clones resistant to *E. machaeralis* damage need to be identified and planted in the plantation areas to reduce this economic damage. Also, mixed plantations are preferred to reduce the pest incidence, but during this survey, in places where mixed plantations were observed there also *E. machaeralis* incidence was seen. Also, biological control methods can be considered using egg parasitoids *Trichogramma* spp. (Ahmad 1990; Joshi et al. 2006).

#### **Ethical approval**

The proper approval guidelines for Forest Work Experience (FWE) obtained from Paralakhemundi Forest Division, Gajapati district, Orissa, India

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#### **Conflicts of interests**

The authors declare that there are no conflicts of interests.

#### **Data and materials availability**

All data associated with this study are present in the paper.

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